

EXPRESS MAIL NO. EL563154917US

CLAIMS

17/11/99

1. A computer network comprising:
  - 2 a file server;
  - 3 a file server application installed on the file server;
  - 4 a client computer;
  - 5 a client application installed on the client computer;
  - 6 a proxy server application installed on the file server, the proxy server application
  - 7 operative to receive a file request from the client application, send a client side applet to
  - 8 the client computer and send the client side applet information selected from a group of
  - 9 the availability of network resources consisting of a time to start a download of the file,
  - 10 a time to complete the download of the file, and a count of other file requests received
  - by the file server.

00441632 070700

**EXPRESS MAIL NO. EL563154917US**

2. A method for managing request for resources received at a file server comprising steps of:

receiving a request for an information resource by a proxy server application from a client application;

recording information relative to the request in a database;

sending an applet to the client computer;

accessing the database to obtain information relative to one or more other requests for information resources;

determining the availability of one or more network resources selected from a group of available network resources consisting of time to start a download in response to the request for an information resource, a time to complete the download in response to the request for an information resource, and a count of prior requests received for information resources; and

sending information relative to the one or more quantities to the applet.

3. The method of claim 2 further comprising steps of:

receiving a status request from the applet by the proxy server application,

re-determining the availability of one or more network resources selected from a group of available network resources consisting of time to start a download in response to the request for an information resource, a time to complete the download in response to the request for an information resource, and a count of prior requests received for information resources; and

sending updated information relative to the one or more quantities to the applet.

4. The method of claim 2 further comprising steps of:

accessing a file size corresponding to the requested information resource; and  
comparing the file size to a limit value.

**EXPRESS MAIL NO. EL563154917US**

1 5. The method of claim 2 further comprising a step of:  
2 comparing a file type of a file corresponding the requested information resource  
3 to a list of one or more file types.

1 6. The method of claim 2 further comprising steps of:  
2 receiving a status request from the applet by the proxy server application; and  
3 checking if the server load is below a threshold after receiving the status request  
4 from the applet.

1 7. The method of claim 6 further comprising steps of:  
2 checking if the client is next in a queue after receiving the status request from the  
3 applet.

1 8. The method of claim 2 further comprising steps of:  
2 receiving a status request from the applet by the proxy server application; and  
3 checking if the client is next in a queue after receiving the status request from the  
4 applet.

1 9. The method of claim 8 further comprising steps of:  
2 re-determining the availability of one or more network resources selected from a  
3 group of available network resources consisting of time to start a download in response  
4 to the request for an information resource, a time to complete the download in response  
5 to the request for an information resource, and a count of prior requests received for  
6 information resources; and  
7 sending updated information relative to the one or more quantities to the applet.

1 10. The method of claim 9 further comprising a step of:  
2 checking if the server load is below a threshold after receiving the status request  
3 from the applet.

**EXPRESS MAIL NO. EL563154917US**

1 11. A computer readable medium containing programming instructions for managing  
2 request for resources received at a file server comprising programming instructions for:  
3 receiving a request for an information resource by a proxy server application  
4 from a client application;  
5 recording information relative to the request in a database;  
6 sending an applet to the client computer;  
7 accessing the database to obtain information relative to one or more other  
8 requests for information resources;  
9 determining the availability of one or more network resources selected from a  
10 group of available network resources consisting of time to start a download in response  
11 to the request for an information resource, a time to complete the download in response  
12 to the request for an information resource, and a count of prior requests received for  
13 information resources; and  
14 sending information relative to the one or more quantities to the applet.

12. The computer readable medium of claim 11 further comprising programming  
instructions for:  
receiving a status request from the applet by the proxy server application,  
re-determining the availability of one or more network resources selected from a  
group of available network resources consisting of time to start a download in response  
to the request for an information resource, a time to complete the download in response  
to the request for an information resource, and a count of prior requests received for  
information resources; and  
sending updated information relative to the one or more quantities to the applet.

13. The computer readable medium of claim 11 further comprising programming  
instructions for:  
accessing a file size corresponding to the requested information resource; and  
comparing the file size to a limit value.

**EXPRESS MAIL NO. EL563154917US**

1 14. The computer readable medium of claim 11 further comprising programming  
2 instructions for:

3 comparing a file type of a file corresponding the requested information resource  
4 to a list of one or more file types.

1 15. The computer readable medium of claim 11 further comprising programming  
2 instructions for:

3 receiving a status request from the applet by the proxy server application; and  
4 checking if the server load is below a threshold after receiving the status request  
5 from the applet.

1 16. The computer readable medium of claim 15 further comprising programming  
2 instructions for:

3 checking if the client is next in a queue after receiving the status request from the  
4 applet.

1 17. The computer readable medium of claim 11 further comprising programming  
2 instructions for:

3 receiving a status request from the applet by the proxy server application; and  
4 checking if the client is next in a queue after receiving the status request from the  
5 applet.

**EXPRESS MAIL NO. EL563154917US**

1 18. The computer readable medium of claim 17 further comprising programming  
2 instructions for:

3 re-determining the availability of one or more network resources selected from a  
4 group of available network resources consisting of time to start a download in response  
5 to the request for an information resource, a time to complete the download in response  
6 to the request for an information resource, and a count of prior requests received for  
7 information resources; and

8 sending updated information relative to the one or more quantities to the applet.

1 19. The computer readable medium of claim 18 further comprising programming  
2 instructions for:

3 checking if the server load is below a threshold after receiving the status request  
4 from the applet.

**EXPRESS MAIL NO. EL563154917US**

- 1 20. A system for managing the available bandwidth through a gateway from a first  
2 network to a second network comprising:  
3 a plurality of client applications;  
4 a plurality of client side components which interoperate with the plurality of client  
5 applications, each client side component being operative to receive information  
6 resource requests from the client applications, to read a corresponding threshold time  
7 value, and to send the information resource request and the corresponding threshold  
8 time value to a proxy server component;  
9 the proxy server component operative to receive a plurality of information  
10 resource requests and corresponding threshold time values from the plurality of client  
11 side components, the proxy server component comprising:  
12 means for matching up a group of information resource requests  
13 according to a resource identification included in each resource request,  
14 means for deriving a threshold value for the group; and  
15 means for issuing a single resource request corresponding to the group of  
16 information resource requests.
- 17 21. The system of claim 20, wherein the proxy server component is further operative  
18 to receive a response to the single resource request and send the resource request to a  
19 group of the plurality of clients corresponding to the group of information resource  
20 requests.

**EXPRESS MAIL NO. EL563154917US**

1 22. A method for managing network traffic through a network node comprising steps  
2 of:  
3 receiving a plurality of information resource requests at a network node from a  
4 plurality of clients;  
5 reading a set of resource identifiers included in the plurality of information  
6 resource requests; and  
7 matching up a group of the plurality of information resource request according to  
8 the set of resource identifiers.

1 23. A method according to claim 22 further comprising a step of:  
2 issuing a single resource request for the group.

1 24. A method according to claim 22 further comprising steps of:  
2 reading a set of threshold time values corresponding to the group;  
3 deriving a group threshold time value from the set of threshold time values; and  
4 issuing a single resource request for the group at a time indicated by the group  
5 threshold time value.

1 25. A method according to claim 24 wherein the step of deriving a group threshold  
2 value comprises a sub-step of:  
3 selecting a minimum of the set of threshold values.

1 26. A method according to claim 22 further comprising a step of:  
2 storing information derived from the plurality of information resource requests in  
3 a cached request database.



**EXPRESS MAIL NO. EL563154917US**

1 27. The method according to claim 26 wherein said step of matching comprises sub-  
2 steps of:

3 receiving a new resource request including a new resource identifier  
4 corresponding to the new resource request; and  
5 searching the cached database to find a matching group of entries having a  
6 resource identifier matching the new resource identifier.

1 28. The method according to claim 27 wherein said step of storing information  
2 derived from the plurality of information resource requests in a cached request  
3 database comprises a sub-step of:

4 storing a set of threshold time values corresponding to the plurality of information  
5 resource requests in the cached request database.

1 29. The method according to claim 28 further comprising steps of:

2 reading a subset of the set of threshold time values corresponding to matching  
3 group of entries; and

4 deriving a group threshold time value from the subset of the set of threshold time  
5 values.

1 30. The method according to claim 29 wherein the step of deriving a group threshold  
2 time value comprises a sub-step of:

3 selecting a minimum threshold time value from the subset of the set of threshold  
4 time values.

**EXPRESS MAIL NO. EL563154917US**

1 31. A computer readable medium containing programming instructions for managing  
2 network traffic through a network node comprising programming instructions for:  
3 receiving a plurality of information resource requests at a network node from a  
4 plurality of clients;  
5 reading a set of resource identifiers included in the plurality of information  
6 resource requests; and  
7 matching up a group of the plurality of information resource request according to  
8 the set of resource identifiers.

1 32. A computer readable medium according to claim 31 further comprising  
2 programming instructions for:  
3 issuing a single resource request for the group.

4 33. A computer readable medium according to claim 31 further comprising  
programming instructions for:  
reading a set of threshold time values corresponding to the group;  
deriving a group threshold time value from the set of threshold time values; and  
issuing a single resource request for the group at a time indicated by the group  
threshold time value.

1 34. A computer readable medium according to claim 33 wherein the programming  
2 instructions for deriving a group threshold value comprise programming instructions for:  
3 selecting a minimum of the set of threshold values.

1 35. A computer readable medium according to claim 31 further comprising  
2 programming instructions for:  
3 storing information derived from the plurality of information resource requests in  
4 a cached request database.

**EXPRESS MAIL NO. EL563154917US**

1 36. The computer readable medium according to claim 35 wherein said  
2 programming instructions for matching comprises programming instructions for:  
3 receiving a new resource request including a new resource identifier  
4 corresponding to the new resource request; and  
5 searching the cached database to find a matching group of entries having a  
6 resource identifier matching the new resource identifier.

1 37. The computer readable medium according to claim 36 wherein said  
2 programming instructions for storing information derived from the plurality of information  
3 resource requests in a cached request database comprises programming instructions  
4 for:  
5 storing a set of threshold time values corresponding to the plurality of information  
6 resource requests in the cached request database.

1 38. The computer readable medium according to claim 37 further comprising  
2 programming instructions for:  
3 reading a subset of the set of threshold time values corresponding to matching  
4 group of entries; and  
5 deriving a group threshold time value from the subset of the set of threshold time  
6 values.

1 39. The computer readable medium according to claim 38 wherein the programming  
2 instructions for deriving a group threshold time value comprises programming  
3 instructions for:  
4 selecting a minimum threshold time value from the subset of the set of threshold  
5 time values.

**EXPRESS MAIL NO. EL563154917US**

- 41
- 1 40. A network server comprising:
- 2 a server;
- 3 a server application installed on the server; and
- 4 a proxy server application installed on the server, the proxy server application
- 5 operative to receive a file request from a client application installed on at least one
- 6 client computer, send a client side applet to the client computer and send the client side
- 7 applet information selected from a group of the availability of network resources
- 8 consisting of a time to start a download of the file, a time to complete the download of
- 9 the file, and a count of other file requests received by the server.
- 05614692-070700